

AMENDED CLAIMS

[received by the International Bureau on 26 February 2003 (26.02.03);
original claims 1-27 replaced by new claims 1-25 (5 pages)]

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1. An extended polycrystalline superconductor, e.g. a superconducting tape, wire, or foil,
characterized by
 - at least two substrates,
 - each said substrate having deposited thereon a superconducting layer, preferably on a buffer layer on said substrate, and
 - an extensive superconducting contact established between the surfaces of said superconducting layers and extending over at least a fraction of $f = 0.3$ of the length and width of said superconductor.
2. An extended polycrystalline superconductor, e.g. a superconducting tape or wire, or foil,
characterized by
 - a substrate,
 - said substrate having deposited thereon at least one superconducting layer, preferably on a buffer layer on said substrate, and
 - an extensive superconducting contact established between the surface(s) of said superconducting layer(s) and extending over at least a fraction of $f = 0.3$ of the length and width of said superconductor.
3. The superconductor according to claim 1 or 2, *wherein* the superconductor comprises at least two superconducting layers deposited on opposing sides of at least one substrate.
4. The superconductor according to any of the preceding claims, *wherein* the superconductor is rolled, folded or twisted such that the surface(s) of the superconducting layer(s) provide the desired extensive superconducting contact.

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5. The superconductor according to any of the preceding claims, *wherein* the superconducting layers in contact are of preferably different lengths or widths and said contact extends at least over a fraction of about $f = 0.5$ of the length and width of one of said superconducting layers.
6. The superconductor according to any of the preceding claims, *wherein* the superconductor is at least 1 m, preferably several m long.
7. The superconductor according to any of the preceding claims, *wherein* the grains in at least one superconducting layer are aligned so that low-angle grain boundaries are obtained.
8. The superconductor according to any of the preceding claims, *wherein* the average length of the grains in at least one superconducting layer exceeds their average width by at least a factor of 1.5.
9. The superconductor according to any of the preceding claims, *wherein* at least one of the superconducting layers consists of a heterostructure.
10. The superconductor according to claim 9, *wherein* the heterostructure includes at least one doping film.
11. The superconductor according to any of the preceding claims, *wherein* the superconducting contact is established by pressing the superconducting layers together with mechanical means.
12. The superconductor according to any of the claims 1 to 10, *wherein* the superconducting contact is established by sintering and/or soldering the superconducting layers together.

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13. The superconductor according to any of the preceding claims, *wherein* the superconducting contact is established by welding the superconducting layers together.

14. The superconductor according to claim 12 or 13, *wherein* the superconducting contact is established while pressure is applied.

15. The superconductor according to any of the claims 11 to 14, *wherein* the superconducting contact is established by providing an intermediate layer, particularly an intermediate layer deposited onto at least one of the superconducting layers.

16. The superconductor according to claim 15, *wherein* the intermediate layer comprises a powder deposited onto at least one of the superconducting layers.

17. The superconductor according to any of the preceding claims, *wherein* at least one of the substrates is removed before establishing the superconducting contact between the surfaces of the superconducting layers.

18. The superconductor according to any of the preceding claims, *wherein* at least one superconducting layer is separated into pieces before establishing the superconducting contact.

19. The superconductor according to any of the preceding claims, *wherein* at least one of the superconducting compounds used in any of the superconducting layers is a cuprate.

20. The superconductor according to any of the claims 1-19, *wherein* at least one of the superconducting compounds used in any of the superconducting layers belongs to the $\text{ReBa}_2\text{Cu}_3\text{O}_{7-\delta}$ family, Re being a rare earth including La or Y.

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21. The superconductor according to claim 20, *wherein*

- metallic substrates are provided,
- the superconducting compound of the $\text{ReBa}_2\text{Cu}_3\text{O}_{7-\delta}$ family is deposited on both sides of said substrates, preferably onto buffer layers, and
- at least two of these substrates carrying superconducting layers are mounted on top of each other over at least a third of their length or width.

22. A method for making an extended superconductor, e.g. a wire, tape, or foil, *characterized by*

- depositing at least two superconducting layers onto at least one substrate, preferably onto an intermediate buffer layer on said substrate,
- establishing an extensive superconducting contact between the surfaces of said superconducting layers, said superconducting contact extending over at least a predetermined fraction of the length and width of said superconducting layers.

23. A method for making an extended superconductor, e.g. a wire, tape, or foil, *characterized by*

- depositing at least one superconducting layer onto at least one substrate, preferably onto an intermediate buffer layer on said substrate,
- rolling, folding and/or twisting said at least one substrate for establishing an extensive superconducting contact between the surfaces of said superconducting layer(s), said superconducting contact extending over at least a predetermined fraction of the length and width of said superconducting layer(s).

24. The method for making a superconductor according to claim 23, *wherein*

- a single substrate is used,
- said substrate is rolled, folded or twisted such that one part of the superconducting layer contacts another part of the same or another superconducting layer to establish the desired extensive superconducting contact between the surfaces of said superconducting layers.

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25. The method for making a superconductor according to claim 22 or 23,

wherein

the superconducting layer is obtained by

- depositing a superconducting compound onto a substrate, preferably onto a buffer layer on said substrate, thus producing a multilayer and
- subsequently separating or splicing the multilayer obtained this way.